PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference GP9004-PC	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. **PCT/KR2003/000653**	International filing date *(day/month/year)* **01 APRIL 2003 (01.04.2003)**	Priority date *(day/month/year)* 01 APRIL 2002 (01.04.2002)
International Patent Classification (IPC) or national classification and IPC **IPC7 G02F 1/1335**		
Applicant **HUNATECH CO., LTD. et al**		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I [X] Basis of the report
   - II [ ] Priority
   - III [ ] Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV [ ] Lack of unity of invention
   - V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI [ ] Certain documents cited
   - VII [ ] Certain defects in the international application
   - VIII [ ] Certain observations on the international application

Date of submission of the demamd	Date of completion of this report
29 OCTOBER 2003 (29.10.2003)	20 JULY 2004 (20.07.2004)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer YANG, Jae Seok Telephone No. 82-42-481-5988

Form PCT/IPEA/409 (cover sheet) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International aplication No.
PCT/KR2003/000653

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:
pages 1-37 . as originally filed
pages _____ . filed with the demand
pages _____ . filed with the letter of _____

☒ the claims:
pages _____ , as originally filed
pages _____ . as amended (together with any statment) under Article 19
pages _____ , filed with the demand
pages 38-40 , filed with the letter of 10 JULY 2004

☒ the drawings:
pages 1/46-46/46 , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language English which is

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☒ the language of publication of the international application(under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/ or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained inthe international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disc losure in the international applicationas as filed has been furinshed.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, Nos. 4,7

☐ the drawings, sheet _____

5.

☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box(Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-3, 5-6, 8-9	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-3, 5-6, 8-9	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-3, 5-6, 8-9	YES
	Claims	NONE	NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents which are cited as particularly relevant in the Written Opinion:

D1: JP 10-153779 A(HITACHI LTD) 09 JUNE 1998
D2: WO 99/06881 A(HITACHI LTD) 11 FEBRUARY 1999
D3: WO 2000/57241 A(LG CHEMICAL LTD) 28 SEPTEMBER 2000

Essential technical features of amended Claim 1 are as follows.
a) The countless recesses have random shapes and at the same time the gradation pattern of the above recesses meets the requirement that, all the features of the density, the profile Ra, the profile Ry and the contour size of the recesses have a varying pattern gradually increasing with the distance from the side of the lighting guide panel.
b) The countless recesses are formed into random shapes by a sandblasting method.

None of the above documents disclose the essential technical features of the amended Claim 1. According to D1 and D2, the dots have regular shapes, and D1 does not disclose the profile Ra, the profile Ry and the contour size of the recesses. Therefore, there are differences in view of the shape and pattern of the recesses(or dots) between the inventions of the above documents and the claimed invention.

D3 discloses that the pattern 31 may be formed by a sandblasting method. However, D3 fails to teach a sandblasting method in detail and a method on how the gradation pattern defined in the amended Claim 1 can be formed by a sandblasting method.

Therefore, the amended Claim 1 and its dependent Claims 2-3, 5-6 and 8-9 are considered to be novel, to involve an inventive step and to be industrially applicable.

10/509840
PT04 Rec'd PCT/PTO 30 SEP 2004

CLAIMS

1. (Amended) A light guiding panel which is made as a transparent substrate of a thin hexahedron shape and reflects source light that is incident through at least one side so that the light is emitted to the front surface of the substrate,

wherein countless minute recesses are formed by a sandblasting method in random shapes on the flat bottom surface of the substrate so as to disperse the source light to be guided to the front surface of the substrate, where the sandblasting method is controlled to ensure that injection amount of minute particles is constant with time through a process of forming the recesses so that the number of the minute particles impinging on a unit area of the bottom surface of the substrate in a unit time and the impact force on the bottom surface of the substrate by the minutes particles gradually increase as a distance from the side, through which the source light is incident, increases,

each of the recesses being too small to be seen with the naked eye and no seeable light spot by each of the recesses appears on the front surface of the light guiding panel when the source light is incident through the side of the light guiding panel, and

the countless minute recesses on the bottom surface of the substrate forming a gradation pattern that all of the density, the arithmetical mean derivation of the profile Ra, the maximum height of the profile Ry, and the mean value of the contour size of the recesses gradually increasing, as a distance from the side of the light guiding panel, through which the source light is incident, increases.

2. (Amended) The light guiding panel of claim 1, wherein the minute particles used for the sandblasting method are selected from the particles of size #100~#200.

3. The light guiding panel of claim 1, wherein the average complexity of the contours of the recesses and a recess surface profile gradually increases as a distance from the vicinity of the side, through which the source light is incident, increases.

4. (Deleted)

5. (Amended) The light guiding panel of claim 1, wherein when recesses are processed by using the sandblasting method, in order to maintain a constant amount of injected minute particles, minute particles are made to follow a stage of free-falling in a process for injecting the minute particles.

6. The light guiding panel of claim 1, wherein the transparent substrate is made of acryl resin.

7. (Deleted)

8. (Amended) A backlight apparatus using the light guiding panel claimed in any one of claims 1-3, 5 and 6, comprising:

a tube optical source which is arranged parallel to and along at least any one side or both sides of the light guiding panel, and if electric power is supplied, generates light so that the light is incident into the light guiding panel through the side of the light guiding panel;

a reflection hat which surrounds the optical source such that the light of the optical source is reflected into the light guiding panel;

a bottom surface reflection plate which is attached to the bottom surface of the light guiding panel so as to reflect light which passes through the bottom surface, back into the light guiding panel; and

a side reflection plate which is attached to sides of the light guiding

panel, at which the optical source is not installed, and reflects light incident on the side reflection plate into the light guiding panel,

wherein without placing a diffusion sheet on the front surface of the light guiding panel, the backlight apparatus is used as a backlight for a transparent or translucent printed film or a liquid crystal display (LCD) unit.

9. The backlight apparatus of claim 8, further comprising:

an assembly frame which accommodates the light guiding panel, the tube optical source coupled with the light guiding panel, the reflection hat, the bottom surface reflection plate, and the side reflection plate, so as to form a single body apparatus.